A NEW SPECIES OF ACMÆODERA (COLEOPTERA- BUPRESTIDÆ) WITH BIOLOGICAL NOTES ON OTHERS FROM SANTA BARBARA COUNTY, CALIFORNIA

By BURDETTE E. WHITE

University of California, Berkeley

Sunset Valley, which is near Figueroa Mountain in the Santa Barbara County portion of the Coast Range, has, through the results of three collecting trips, been proved to be an unusual region for the genus *Acmæodera*. A total of 18 species and 2 subspecies was found to inhabit this area. Two of these were new species with the probability of a third being new. One of these has since been described while another is described below.

Two of the three trips were made exactly one year apart—July 4, 1937 and 1938. The third trip followed two weeks after the second. The members of the first trip were Mr. George Holsten and the author; the second included Mr. V. L. Woolley, Mr. Robert Zaph, and the members of the first trip; the third trip was a hasty but successful one made by Mr. Mont Cazier and the author.

The 1937 seasonal development of the flora was apparently about two weeks earlier than that of 1938, probably due to the abundance of precipitation in the intervening winter. This may or may not have been responsible for the fact that a slightly different group of species was taken on each of the trips. The majority of the specimens and representatives of all the species were collected along a three mile stretch of road that was cut through the "chamise belt" at about 2000 feet elevation. The fact that 19 members of a single genus were collected in such a restricted area seems in itself worthy of mention; however, along with the list of these species will be included the preferred plant of each as was shown by the persistence of the adults in flying to, or by the fact that they were consistently beaten from, the same species of plant.

The main plants with which the *Acmæodera* were associated were scrub oak, *Quercus dumosa*; hard tack, *Cercocarpus betuloides*; chamise, *Adenostoma fasciculatum*; *Eriodictyon crassifolium* variety *traskiæ*; Christmas berry, *Photinia arbutifolia*;

manzanita, *Arctostaphylos* sp.; and an unidentified, small, yellow-flowered composite. These, with a few other species of plants, formed a rather dense association on the shale slopes.

Although host preferences are of very little significance for adult *Acmæodera* according to the general consensus of opinion, the author is convinced that they have some biological significance, at least locally. On the three trips which were taken at relatively wide intervals, careful observations were made of the host preferences of each species. Each particular species, with the exception of those visiting flowers, was consistently taken on a single species of plant. This, together with the fact that numerous specimens were collected, that the plants were not at all isolated but growing in close association, and finally that similar results were obtained on each of the three trips, surely suggests at least a strong degree of local host selectivity. However, most of the species from the Santa Barbara region have been reported from different plants in other localities, which would indicate that the host specificity is local or that there has been some error in the citing of the plant species.

Acmæodera fenyesi Fall

Over sixty individuals of this well-known species were taken as they flew to *Eriodictyon crassifolium* var. *traskiæ*. Not a single specimen was observed flying to any other plant and none was beaten from any other plant. These specimens of *fenyesi* differ from the typical form by being entirely immaculate and in being more shining bronze.

Acmæodera plagiaticauda Horn

Seven specimens of this rare species were collected after hours of beating manzanita shrubs (*Arctostaphylos*). These specimens present a considerable degree of variation from *plagiaticauda* of other regions. The median lateral spot of the elytra is straw-yellow in place of the usual red of more northern specimens.

Acmæodera jocosa Fall

Some 200 specimens of this beautiful species were taken. All were swept out of the air as they hovered over *Adenostoma fasciculatum*, or were collected from the tips of the branches of

that plant. Not a single specimen was observed to light on any other plant but this, although other species of plants often grew so close as to have their branches mixed with those of the *Adenostoma.*

ACMÆODERA ADENOSTOMÆ Cazier

The author collected 30 specimens of this species and approximately 30 more were taken by the other members. The preferred plant, as the name implies, is the chamise, *Adenostoma fasciculatum.* This species greatly resembles *jocosa* in markings and was taken with that species on the same plant.

ACMÆODERA COQUILLETTI Fall

Over 50 specimens of this pretty species were collected from *Quercus dumosa.* They were not observed on any other plant.

Acmæodera holsteni White, new species

Moderate sized; dark chocolate bronze; broad and somewhat depressed, the sides of body parallel to apical third of elytra; elytra with a series of three transverse lateral spots, the anterior spot largest and yellow, located medianly and internally curved forward, the mid-spot smaller and red externally, the posterior spot subapical, small and reddish marginally. The dorsum moderately covered with rather long, erect, light gray and fuscous hairs, somewhat recumbent over apices of elytra.

Head densely covered with medium sized punctures; upper portion densely covered with erect dark hairs, the lower portion immediately above clypeus more sparsely covered with shorter whitish hair. Antennæ finely pubescent, the last seven segments broadly serrate, extending back as far as basal third of pronotum. Pronotum as wide as base of elytra and a little less than twice as wide as long, 7:4; evenly, moderately punctured on the disk, the punctures increasing in size laterally; lateral margin gradually, evenly rounded to apical angle; a median, shallow carina extending from base to apical third; a conspicuous shallow fovea near basal angles; surface relatively densely clothed with long, erect, dark and light hairs which are much shortened at apical angles; basal margin reflexed ventrally so as to be visible only from a lateral view. Elytra each with a median lateral kidney-shaped spot yellow, extending from margin two-thirds of the distance to suture; another spot at apical fourth narrower, externally red, extending from margin three-fourths of the way to suture; a third subapical spot more red than yellow; elytral intervals smooth on the disk, laterally rugose, first three

striæ consisting of well defined circular punctures basally but becoming elongate posteriorly, finally coalescing into a narrow groove at the middle and extending thus to apex, the intervals with a row of fine punctures with a single hair arising from each; umbone conspicuous. Body beneath bronze; evenly punctured except at base of first ventral segment which is more coarsely punctured; latero-ventral area between second and third pairs of legs and especially near elytral margin covered with long white hair; prosternum trisinuate with strong cusps. Length, 9mm.; breadth, 3:25 mm.

Holotype, female, and allotype, male, collected at Sunset Valley, Santa Barbara County, California, July 4, 1938. Four hundred paratypes, mostly collected by Mr. George H. Holsten and the author on *Adenostoma fasciculatum* at the same locality and on the following dates: July 4, 1937, July 4, 1938, and July 16, 1938. A few specimens were also collected by Mr. M. A. Cazier, Mr. V. L. Woolley, and Mr. Robert Zaph, all from the above locality. A single specimen was collected by Mr. C. D. Michener at the Frances Simes Hastings Natural History Reservation at Jamesburg, Monterey County, California, June 13, 1938, elevation 1900-2700 feet (Santa Lucia Mts.). A specimen labeled, "San Gabriel Mts. Cal., VI-1920" and one labeled, "Pasadena, Cal., VI-10-1916" are in the Cazier collection. Paratypes are deposited in the collections of the following men: Mr. Frank Parker, Mr. C. A. Frost, Mr. J. J. du Bois, Dr. H. C. Fall, Mr. Mont Cazier, Mr. H. B. Leech, Mr. Robert Zaph, Mr. V. L. Woolley, Mr. M. Embury, and in the California Academy of Sciences.

It is with great pleasure that this species is named after Mr. Holsten, who so kindly aided the author in collecting most of the above-mentioned specimens.

Acmæodera holsteni has been confused with several other species, particularly *coquilletti* and *angelica*. *Holsteni* differs from *coquilletti* by being darker (chocolate bronze), while the latter has a highly shining, brassy dorsal surface. *Holsteni* is also broader, more depressed, and more blunt apically. There are also good differences in the structure of the subgenital plates in the females of the three species (see figures). From *angelica*, *holsteni* differs by having the dorsal surface smooth. *Angelica* typically has the dorsal surface shining black, has a

different structure and placement of the spots, is less depressed, and has the apices of the elytra more pointed, and the margins of the pronotum less evenly rounded apically than in *holsteni*.

Holsteni is constant in all characters but the spots. Occasional specimens have an additional sub-basal yellow spot on each elytron. Other specimens have been observed with a considerable reduction in the size of the spots. The sexes can be distinguished only by dissection.

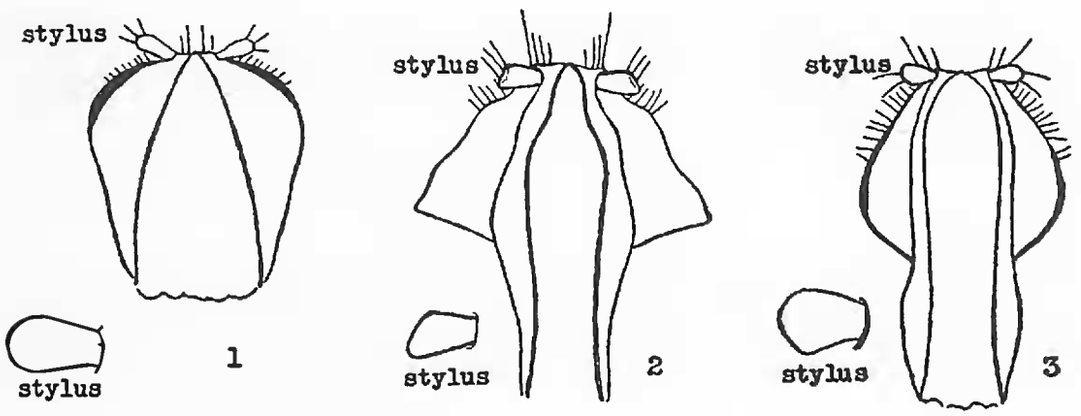

Fig. 1, *Acmœodera coquilletti* Fall, subgenital plate of female; 2, *A. holsteni* White, n. sp., same; and 3, *A. angelica* Fall, same.

ACMÆODERA ANGELICA Fall

Several specimens of this variable species were taken from *Cercocarpus betuliodes*.

ACMÆODERA ANGELICA NEXA Fall

Over one hundred specimens of this form were collected along with *angelica* on *Cercocarpus betuliodes*.

ACMÆODERA HEPBURNI LeConte

This species occurred abundantly on the flowers of *Eriodictyon crassifolium* var. *traskiæ* as well as on various other flowers, particularly a small yellow-flowered composite.

ACMÆODERA QUADRISERIATA Fall

This species, though not common, was taken on a variety of flowers. It was found most abundantly on the above-mentioned yellow composite.

ACMÆODERA ACUTA LeConte

Numerous specimens were swept from the yellow-flowered composite along with *hepburni*, *quadriseriata*, and *gemina*. These specimens differ considerably from the usual *acuta* in their smaller average size, the reduction of the markings of the elytra, and by their stronger brassy lustre.

ACMÆODERA CONNEXA LeConte

Only a few of this otherwise common and well-known species were collected. They were found on various flowers, including milkweed (*Asclepias*).

ACMÆODERA PRORSA Fall

More than fifty examples of this beautiful species were collected from *Eriodictyon crassifolium* var. *traskiæ*. On the last trip when the blossoms of the *Eriodictyon* were found to be dried up, eight specimens of *prorsa* were caught flying about the blossoms of *Photinia*.

ACMÆODERA SINUATA Van Dyke

This strikingly distinctive species was apparently rare. However fifteen specimens were taken, and all were from *Cercocarpus betuliodes*.

ACMÆODERA DOHRNI Horn

These specimens are here called *dohrni* only tentatively. They differ from the description of that species in several features and a definite decision cannot be made before they are compared with the type. Fourteen examples were collected from the *Cercocarpus betuliodes*.

ACMÆODERA MARIPOSA BERNARDINO Van Dyke

A dozen specimens were taken from *Cercocarpus betuliodes*. A few of the specimens are more brassy and are lighter colored than the specimens described by Van Dyke, but they are similar in markings and other characteristics.

ACMÆODERA DOLOROSA Fall

Two specimens of this species were taken in flight.

ACMÆODERA POSTICA Fall

Twenty specimens of this rather uncommon species were beaten from *Cercocarpus betuliodes.*

ACMÆODERA GUTTIFERA LeConte

Ten examples were caught flying about and resting on the small dead twigs of *Cercocarpus betuliodes.*

ACMÆODERA GEMINA Horn

Several specimens of both the vittate and the mottled form (*nebulosa* Horn) were collected in flight, on dry grass, and on the small yellow-flowered composite.

BIOLOGY OF VESPINE WASPS

A Contribution to the Biology of North American Vespine Wasps. C. D. Duncan, Stanford Univ. Publ. Biol. Sci., Vol. VIII, No. 1, 272 pages, LIV plates, 1939. Price, paper, $2.50; cloth, $3.25.

The accumulated observations, dissections, and experiments of twenty years have been brought together in excellent style in this combined morphological, systematic, and biological account of the vespine wasps. Sixty-eight pages and thirty-two plates are devoted exclusively to a detailed account and portrayal of the skeletal and muscular morphology of the Western yellow-jacket, *Vespula pensylvanica* (Sauss.). A high standard of perfection has been attained in delineation of morphological details and in the labeling and reproduction of plates.

Systematically, three genera are recognized and defined on the basis of structural and biological characteristics, namely *Vespa* Linnaeus, *Vespula* Thom., and *Dolichovespula* Rohwer.

The biological section deals with "habits, behavior, nest building, and life history" of various species of Vespinæ including descriptions of the immature stages of *Vespula pensylvanica.* This section is profusely illustrated with fifty-eight separate photographs of nests and nesting sites, excellently reproduced by the collotype process.

Dr. Duncan has shown, in this work, what can be accomplished by intensive and enlightened research, even on the commonest of insects.—R. L. Usinger.